

(No. 2852.)

“PALGRAVE.”

The Merchant Shipping Acts, 1854 to 1876.

In the matter of the formal Investigation held at Greenock, on the 29th and 30th of January, the 1st and 2nd of February, and the 15th of March 1886, before H. C. ROTHERY, Esq., Wreck Commissioner, assisted by Captain WILSON, Vice-Admiral PICKARD, Captain ANDERSON, and W. B. ROBINSON, Esq., Chief Constructor R.N., as Assessors, into the circumstances attending the damage sustained by the sailing ship “PALGRAVE,” and the loss of the lives of two of her crew, on the 3rd of December 1885.

Report of Court.

The Court, having carefully inquired into the circumstances of the above-mentioned shipping casualty, finds, for the reasons annexed, that the damage sustained by the said vessel, and the loss of life that ensued, were due to the fall of the maintopmast and the gear attached; and that such damage resulted from the excessive stability of the vessel, causing her to labour and roll very heavily in the gale which she encountered.

The Court makes no order as to costs.

Dated this 15th day of March 1886.

(Signed) H. C. ROTHERY,
Wreck Commissioner.

We concur in the above report.

(Signed) R. WILSON,
BENJ. S. PICKARD,
ABSM ANDERSON, } Assessors.
W. B. ROBINSON,
C.C.R.N., }

Annex to the Report.

This case came before the Court at Greenock on the 29th and 30th of January and the 1st and 2nd of February last, Mr. Johnston appearing for the Board of Trade, Sheriff Comrie Thomson for the owners, and Mr. Spens for the master of the “Palgrave.” Seventeen witnesses having been produced by the Board of Trade, and one by Mr. Spens, Mr. Johnston handed in a statement of the questions upon which the Board of Trade desired the opinion of the Court. Two further witnesses having then been produced by the Board of Trade, and six witnesses by Sheriff Comrie Thomson, the Court, at the application of the Board of Trade, adjourned the case to allow further evidence to be produced. The case again came on for hearing at Greenock on the 15th of March instant, Mr. Johnston again appearing for the Board of Trade, and Mr. Orkney for the owners of the “Palgrave.” Two witnesses having been produced by Mr. Orkney, and one by the Board of Trade, Mr. Orkney then addressed the Court on behalf of his parties, and Mr. Johnston having replied, the Court proceeded to give judgment on the questions upon which its opinion had been asked. The circumstances of the case are as follow:—

The “Palgrave,” which is an iron four-masted sailing ship, belonging to the port of Port Glasgow, of 3,174 tons gross and 3,111 tons net register, was built at Port Glasgow in the year 1884; and, at the time of the casualty which forms the subject of the present inquiry, she was the property of the Messrs. Hamilton of Beuchlutha, Port Glasgow, Mr. William Hamilton being the managing owner. She left Cardiff on the 30th November last, in tow of two steam tugs, and in charge of a duly licensed pilot, and having on board a crew of 41 hands all told, one stowaway, the captain's wife, four children, and niece; and with a cargo of 1,289 tons of iron, and 2,911 tons of coke, making in all 4,200 tons, bound to San Francisco. All proceeded well until they got about 15 miles to the westward of Lundy Island, when the hawser parted, upon which

sail was set, and the vessel proceeded on her course with the wind from about W.N.W. until about 8 a.m. of the 2nd December, when the wind having freshened they reefed courses and took in upper topsails; but at about 8 p.m., the wind having moderated, they again set the upper topsails and top-gallant sails. At about 2 a.m. of the 3rd it again began to blow strong, upon which all small sails were taken in; and, as the wind increased, the top-gallant sails and staysails were also taken in. During the day the upper topsails were stowed, and the courses hauled up, and at about 5 p.m. they wore ship to the S.S.E., and kept her close hauled on the starboard tack under four lower topsails, foresail, and fore topmast staysail, head reaching, with the helm hard down. The gale continued to increase, blowing with hurricane force during the squalls, and the vessel, we are told, rolled and laboured heavily. Between 9 and 10 p.m. the chief officer observed the upper mizen topsail blowing out of the gaskets, upon which he ordered some hands aloft to make it fast, and whilst they were so engaged the upper main topsail was seen to be blowing adrift, upon which the boatswain, with the remainder of the watch, was told to go and secure it. Whilst they were so engaged the lower main topsail was seen to be coming adrift, upon which all hands were called up on deck to make it fast; but before they had had time to go aloft, and whilst the boatswain and his hands were lying out on the yard, waiting for some additional gaskets, the vessel gave a heavy roll, and the main topmast with all the yards and gear attached fell over to leeward. Lights were immediately procured, and the wounded men having been picked up were taken to the cabin, when it was found that two hands were missing, and that six others were more or less injured, one an apprentice having had his leg broken. After this the vessel rolled more than ever, filling her decks with water, and making it dangerous to get about the deck, owing to the twisted wire rigging which was swinging about. Nothing therefore could be done during the night, but on the following morning all hands were called up to clear the wreckage; and at 10 a.m., whilst so engaged, the mizen topmast, with all the gear attached came down, and falling over to windward, the master moved the helmsman to the after wheel, lest the wreckage of the mizen topmast should come down upon him. At noon on that day they got an observation, and found that they were in latitude 50° 32' north and longitude 8° 15' west. During the day the vessel was put before the wind, as it was found that she rode more easily that way, and by 6 p.m. they had cleared away the whole of the wreckage on the mainmast, but they could do nothing with that on the mizenmast beyond lashing it to the rigging, as they feared that, if they cut it away, it would come down and crush the deck house. The next day, the 5th, the gale recommenced as bad as ever; but on the 6th, the wind having moderated and settled into S.W., a course was steered for Queenstown, and shortly afterwards the P. and O. Company's steamer “Deccan” came up, and a rope having been passed to her she proceeded to tow them; but at midnight the hawser parted, and after lying by them until about 2.30 a.m., a gale sprang up from the eastward, and the weather becoming thick, the vessels lost sight of one another; and for 3 days the “Palgrave” had to run before the gale under bare poles, at the end of which time she was found to be in about latitude 47° north and longitude 15° west. On the 10th, the gale having moderated, they were able to clear away the wreck of the mizen-topmast; and the wind having settled into the S.W., a course was steered for Queenstown, where she arrived at 3 a.m. of the 15th, and whence she was afterwards towed by the steam tug “Storm Cock” to Greenock.

These being the facts of the case, it may be well, before I proceed to deal with the questions, to mention some facts connected with the earlier history of the vessel. She seems to have been built by Messrs. Hamilton to the order of Captain Hatfield, of Liverpool, but that gentleman having failed they had to take to her themselves. There can be no doubt that she is a very superior vessel, having been built under special survey and classed 100 A 1 at Lloyd's, and we can perhaps hardly have a better proof of the strength and goodness of her construction than the fact that, notwithstanding the very severe gale through which she

passed, she seems not to have made any water at all. She had, it seems, made one voyage to Calcutta and back, taking out 4,500 tons of salt and bringing home a cargo of 5,050 tons of general merchandize, and we were told by the master that she delivered both cargoes, without having suffered the slightest damage. Having discharged her homeward cargo in London, she took in about 588 tons of scrap iron, with which she proceeded to Cardiff, where she filled up with the remainder of her cargo, the quantity, we are told, in the lower hold when she sailed being 1,084 tons of iron and 1,700 tons of coke, and in the 'tween decks 205 tons of iron and 1,212 tons of coke, or a total weight of 2,784 tons in the lower hold and 1,417 tons in the 'tween decks.

I now proceed to deal with the questions which have been submitted to us, and the first question which we are asked is, "Whether, having regard to her construction, the stability of the vessel was so great as to require careful loading?" Captain Hatfield told us that his instructions to Messrs. Hamilton were that the vessel should be built so as to be able to carry a full homogeneous cargo, without ballast; in other words, he required them to build him a very stiff vessel, and that they seem to have succeeded in doing. Now, this being so, it is obvious that she would require careful loading, lest when she got to sea she should prove to be too stiff.

The second question which we are asked is, "Whether the rigging was sufficient and properly constructed?" We are told that both the standing and running rigging were obtained from Messrs. Garnock, Bibby and Co., of Liverpool, one of the best firms, I am told, in the United Kingdom, and it seems to have been thoroughly good in all respects. It is true that, owing to the size of the vessel, Captain Hatfield had at first stipulated that there should be three topmast back stays, as well as one capstay to each topmast; but only two topmast back stays were provided, and Captain Hatfield told us that as two were deemed sufficient by Lloyd's, he had assented, and the witnesses stated that in their opinion two were quite sufficient.

The third question which we are asked is, "Whether the caps of the masts were constructed of proper material?" It appears that the fore part of the rings of the main and mizen caps, which held the heels of the topmasts, were broken off; but whether the caps broke first and thus let the topmasts come away, or that the topmasts broke and in falling broke the caps, no one could tell us; the impression, however, of the officers was that the topmasts broke first, and in falling broke the caps. Now we are told that the caps were of cast steel and were 10 inches deep, and that they had been supplied by Messrs. Wyllie and Co., Glasgow. Cast steel caps are not, it seems, so common as wrought iron caps, but, if they are free from flaws, they are said to be stronger. The first set which had been supplied was rejected, owing to their not having been able to stand the test which was applied to them, and which we were told by Lloyd's agent, as well as by the Board of Trade surveyors, was an extremely severe one, viz., being struck on the eyes with a 28lb. hammer. A second set was accordingly sent, and having stood the required test they were put into her. Mr. Black, who was employed by the underwriters on the "Palgrave" to look after their interests, and whose duty it would be to discover the defects in these caps, if any existed, has told us that he met the vessel on her arrival at the Tail of the Bank, and that he made a very careful examination of the caps, or rather of the portions which remained, and that in his opinion they were of first rate material. He told us that the places where they had broken showed no signs of brittleness in the metal, and that it was a tear rather than a fracture, as though it had been subjected to a heavy tensile strain. It is true that the Messrs. Hamilton have in place of the two steel caps supplied her with two wrought iron caps, not because they thought the wrought iron to be better, but because they could be more easily obtained. The vessel had already made one voyage to the East with these caps, and there is nothing to show that the cast steel caps were not constructed of proper material, and that they would not have been able to withstand any ordinary strain that might be put upon them, although probably not a blow from the falling masts and spars.

The fourth question which we are asked is, "Whether the topmasts were properly constructed and of sufficient strength?" We are told that these topmasts, which had a diameter of only 18½ inches, were not strengthened with angle irons in the inside, as in our

opinion they should have been, looking at the size of the vessel. It has not indeed been proved that they broke before the caps did, but the balance of the evidence seems to be that they did; and if so, it would go far to shew that they were not strong enough for the purpose. We are, therefore, not prepared to say that the topmasts were properly constructed and of sufficient strength.

The fifth question which we are asked is, "Were the lower topsail yards properly and sufficiently slung and supported?" The lower topsail yards were slung in what is now a very usual way; namely, by being hung to an eye at the fore part of the cap; and there can be no doubt that in a heavy gale of wind a very great strain would be brought to bear on it, making it very desirable to relieve that strain if it were possible. It has been suggested that this might have been done by a crutch; but then it is said that the crutch would only be of use as a support when the yards were square. The assessors, however, are of opinion that they might be so constructed as to afford some support, even when the yards were not square. They think therefore, looking at the great size of this vessel, that she should have had crutches to support the yards, and which would have relieved to some extent the strain on the caps.

The sixth question which we are asked is, "Whether, when the vessel left Cardiff, the rigging was properly set up?" It seems that the rigging was set up by regular riggers at Cardiff, and there is no reason to think that it was not properly set up. No doubt when a vessel first gets to sea the rigging requires to be carefully looked at to see that it does not become slack, and this the chief officer seems to have done.

The seventh question which we are asked is, "Whether the vessel as laden had so much stability as to make her uneasy and laboursome in a seaway?" This is perhaps the most important question with which we have to deal in this case. And first it will be well that I should state how the case stood previous to the adjournment. First, then, there was the boatswain, whose evidence appears to us to be deserving of considerable weight, and who told us that the vessel laboured more than any vessel he was ever in. Then we had some of the stevedores saying that if they had had the stowing of her they would, looking at her great stiffness, have put about 200 tons more of the cargo in the 'tween decks. Then we had Captain Hatfield, the gentleman who designed her, and for whom she was built, telling us that he intended her to be a very stiff vessel, and capable of carrying a full homogeneous cargo without ballast of any kind, and that in his opinion from the best calculations which he had been able to make, he thought that the position of the centre of gravity of the vessel, when empty, would be about 7 feet above the bottom of the keel, which, if true, would have given her an extraordinary amount of stability. Lastly, we had the evidence of Mr. Black, a gentleman of considerable knowledge and experience in these matters, and who told us that from the best calculations which he had been able to make, he thought that the vessel would probably have had, when she left Cardiff, a metacentric height of 4.4 feet. Mr. Black, however, stated that the vessel had never been inclined, and that consequently it would be quite impossible to say with accuracy where her centre of gravity was, and without that the metacentric height would be more or less guess work. Mr. Black also told us that his estimate of the metacentric height had been made on the assumption that there had been a platform not only in No. 2 hatchway, but also in the other hatchways, upon which the iron in the lower hold had been placed; but that if, as the fact was, there was no platform in No. 3 hatchway and only a half platform in No. 4, that would, he thought, make the metacentric height about 5 feet. Under these circumstances the Court stated that it was not satisfied on the evidence that had been laid before it, that the vessel had not on leaving Cardiff too great an amount of stability; and Mr. Johnston thereupon, on behalf of the Board of Trade, asked that the inquiry should be adjourned in order to have the vessel inclined and the question definitively settled. To this application the Court assented, intimating at the same time that in its opinion it would be proper that notice should be sent by Messrs. Hamilton to the Board of Trade when they were ready to incline her, so that the Board might send down some competent person to attend the experiments, and then make necessary calculations for metacentric height.

Thus matters stood when the Court adjourned. Since then the vessel has, we are told, been twice inclined,

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once on the 10th of February last, when about half the cargo had been discharged, and again on the 26th of February, when she was laden with the cargo with which she finally left this country. On the first occasion no one was present for the Board of Trade, but the experiments were conducted by Mr. Phillip Jenkins, a naval architect and Lloyd's surveyor at this port, and at present discharging Professor Elgar's duties at the University of Glasgow. But on the second occasion, besides Mr. Jenkins, there was also present, on behalf of the Board of Trade, Mr. William Edward Smith, who is in the Constructor's Office at the Admiralty, Whitehall, and who is also Professor of Naval Architecture at the Royal Naval College. Both these gentlemen told us that in making the experiment they used a plumb line 23 feet 9 inches long, and that on removing 20 tons of pig iron from the centre of the ship to a distance of 21 feet 1 inch to starboard, they found that the lower end of the plumb line had shifted $5\frac{1}{2}$ inches to starboard. They then transferred the 20 tons to the same distance on the port side, and found that the plumb line moved $11\frac{1}{2}$ inches to port, or $5\frac{1}{2}$ inches from the vertical. With these data to work upon, the natural and proper course would have been for Mr. Jenkins and Mr. Smith to have calculated separately the metacentric height, and to have informed the Court of the conclusions at which they had arrived. Instead however of so doing, Mr. Jenkins has alone made the necessary calculations, and the reason why Mr. Smith has not done so is, he tells us, because he has not been furnished with the disposition and weights of the several portions of the cargo with which she sailed either from Cardiff or from Greenock, and without which it would of course be utterly impossible to ascertain her metacentric height. Why the Board of Trade, having sent Mr. Smith down to Greenock to see the vessel inclined, should not have given him the necessary particulars to enable him to calculate the vessel's metacentric height, or why, if it was their intention that he should not make the calculations, they should have gone to the expense of sending a gentleman of Mr. Smith's attainments down, when any clerk in the Receiver's Office could equally well have ascertained the distance through which the plummet line moved by the transfer of 20 tons of pig iron from the centre to each side of the vessel, are questions on which the Court has no information. The result however is that the Court is left to decide the question of this vessel's stability solely on the calculations made by the representative of the owners without any assistance from the gentleman who had been deputed by the Board of Trade to attend and see the vessel inclined.

Before however I proceed to state the results which have been arrived at by Mr. Jenkins, it will be well to mention that the disposition and amount of cargo with which she finally left Greenock, was very different to that with which she had started from Cardiff. According to the evidence of the stevedores and others she had, when she left Cardiff, in the lower hold 1,084 tons of iron, and 1,700 tons of coke, or a total of 2,784 tons, and in the 'tween decks 205 tons of iron, and 1,212 tons of coke, or a total of 1,417 tons; and it was very strongly urged by the owners' witnesses that the quantity of cargo in the 'tween decks being in excess of a moiety of that in the lower hold, proved to them that the vessel must have been well and skilfully stowed; at the same time some of the stevedores thought that it would have been better, if even 200 tons more of the cargo had been put into the 'tween decks, and that it would have made the vessel ride more easily. When however Mr. Jenkins came to be examined, he said that it was physically impossible that the 'tween decks could have held so much as 1,212 tons of coke; and that the weight and amount of the iron in the hold and 'tween decks being admitted, and the rest of the vessel being chock full of coke, the disposition of the cargo would be as follows; in the lower hold 1,084 tons of iron and 1,950 tons of coke, or a total of 3,034 tons, and in the 'tween decks 205 tons of iron and 1,025 tons of coke, making a total of 1,230 tons. So that, whilst it had been assumed that on leaving Cardiff the vessel had had 2,784 tons in the lower hold, and 1,417 tons in the 'tween decks, and that this was considered to be a very good disposition of the weights for a very stiff vessel like the "Palgrave;" Mr. Jenkins said that there must have been 3,034 tons in the lower hold, and 1,230 tons in the 'tween decks, or only about $\frac{2}{3}$ ths as much in the 'tween decks that there was in the lower hold, which would be apparently a very bad disposition of the cargo, if it was necessary that there should be in the 'tween decks more than one half of what there was in the lower holds.

And now as to the amount of the cargo with which the vessel left Greenock. It seems that in discharging the coke, it became so much broken up as to be useless for re-shipment; and as they could not buy coke at Greenock to replace it, Messrs. Hamilton determined to ship in place of the coke more iron and some bricks; and she left with 1,155 tons of scrap and pig iron, and 700 tons of coke, or a total of 1,869 tons in the lower hold, and of 905 tons of iron, 348 tons of bricks, and 56 tons of coke, or a total of 1,309 tons in the 'tween decks; so that when she left Greenock she had about $\frac{2}{3}$ ths the weight of cargo in the 'tween decks that there was in the lower hold.

Let us now proceed to say what are the results at which Mr. Jenkins tells us that he has arrived at in regard to this vessel's stability. He told us that, empty, the height of the metacentre above the garboard strake would be 30 feet, and that of the centre of gravity 23.2 feet, giving her a metacentric height of about 6.8 feet. He said also that, when she left Greenock, the height of the metacentre would be 21.94 feet, and that of the centre of gravity 17.84 feet, giving her a metacentric height of 4.1 feet; and that in the state in which she was when she left Cardiff, the height of the metacentre would be 21.63 feet, and that of the centre of gravity 17.6 feet, giving her a metacentric height of 4.03 feet. According to Mr. Jenkins, therefore, the vessel's metacentric height, when she left Greenock, was practically very nearly the same as when she left Cardiff, although in the former case the weight of cargo in the 'tween decks was about $\frac{2}{3}$ ths of what it was in the lower holds, whereas in the latter case it was only about $\frac{2}{3}$ ths; and he explained the apparent discrepancy by saying that, when she left Greenock, the cargo in the 'tween decks, which consisted mainly of iron and bricks, lay close down on the deck, and therefore near the centre of the ship, whereas on leaving Cardiff the cargo in the 'tween decks, consisting as it did mainly of coke, was raised up to the under side of the upper deck.

Assuming then that the metacentric height, as well when she left Cardiff as when she left Greenock, was somewhat over 4 feet, was this an improper or excessive metacentric height for a laden merchant ship? Both Mr. Jenkins and Mr. Smith thought that it was not; at the same time they admitted that they had little or no experience of merchant sailing vessels, but rather of ships of war, and that their conclusions were based on the fact that there were many ships of war now afloat which had a greater metacentric height than 4 feet. It is, however, to be observed that ships of war stand upon a somewhat different footing to merchant vessels, inasmuch as they require a greater amount of stability to be able to fight their guns, and they are therefore built in such a way as to be able to resist the excessive straining caused by great stability. This, however, is not the case with merchant vessels, whose metacentric height I am advised ought not, when laden, to exceed 3 feet to $3\frac{1}{2}$ feet. Seeing then that this vessel had a metacentric height, when she left Cardiff, as well as when she left Greenock, exceeding 4 feet, we must hold that it was excessive, and such as to make her uneasy and laboursome in a seaway.

The eighth question which we are asked is, "What was the cause of the damage the vessel sustained on the 3rd and 4th December." The breaking away of the main and mizen topmasts on the 3rd and 4th of December was no doubt owing to the great amount of stability which she had, causing her to labour and roll heavily during the gale which she encountered.

The ninth question which we are asked is, "What was the cause of loss of life, and whether every possible effort was made to avoid it?" The loss of life was no doubt the result of the breaking of the main topmast; but we do not see that anything was done, or omitted to be done, which would have prevented it.

The tenth question which we are asked is, "Whether the weather braces were kept taut on the 3rd December, and the vessel in other respects navigated with proper and seamanlike care on that and the following days?" It seems that in wearing the ship the braces got a drift, owing to some of the men slipping upon the wet deck; and I am told by the assessors that that is by no means an unusual occurrence on board ship. The yards swung to and fro about three or four times, but the men gradually hauled in the braces and made them tight. The charge against the chief officer, that he let them go, owing to his being in a state of intoxication, and unable to attend to his duties, appears to us to be utterly without foundation. The assessors are of opinion that the vessel was well navigated, that the master did

right to wear his ship on the afternoon of the 3rd in anticipation of the gale that was coming on; that it was quite right not to send the men aloft, even if they had been willing to go on that night; that all due diligence was used when daylight came to clear away the wreckage; and that the master did quite right not to clear away the wreck of the mizen topmast, which was lying over to windward, until after the vessel had ceased to roll heavily, for there was always a danger of its coming away and smashing in the deck house. At the same time they are of opinion that it would perhaps have been better if he had put her before the wind sooner than he did, for even if he had not made Queenstown there were other ports, such as Falmouth and Plymouth, to leeward.

The eleventh question which we are asked is, "Whether the master or officers are, or either of them is, in default?" It seems that, soon after the arrival of the vessel at Greenock, a paper was sent to the Board of Trade, signed by 21 of the crew, charging the master and the first and second officers with having been under the influence of liquor, and incapable of performing their duty. No more serious charge can possibly be brought against an officer, for, had those charges been proved, the Court would have had no option but to have cancelled their certificates. Some of these men attended to substantiate their statement, but, so far from doing so, they satisfied us that there was not the slightest ground for the charges, and had the Court the power of punishing these men effectually it would certainly do so; to condemn, however, such men as these in costs would be useless.

It remains then only to decide whether costs shall be given to the master and to the owners, both of them having asked for costs against the Board of Trade. Now I do not think that it can be denied that this was a very proper case for an inquiry, two lives having been lost, and six more of the crew more or less seriously injured, and that in such an inquiry the master would be a necessary witness. But then it is said that grave charges have been brought by the seamen against the

master and officers, of which they have been fully acquitted, and if the application had been to condemn the seamen in the costs I could have understood it, but I cannot understand why, because the seamen have brought these charges, the Board of Trade are to be condemned in costs. The Board of Trade have merely laid the statements of the seamen before the Court, as they were bound to do, but they have not pressed the charges, nor have they made them the foundation for any of the questions. It was a mere incident in the inquiry, which has not added to the costs, and I therefore see no reason why the Board of Trade should be condemned in costs.

As regards the owners, there can be no doubt that this vessel is an unusually large vessel, and to some extent of unusual proportions; and yet they thought fit to send her to sea without taking any measures to ascertain what amount of stability she had, and how she could best be laden. That owners should send valuable vessels to sea without having had any calculations made as to their stability appears to me to be utterly unaccountable, when all the requisite information on the subject could be easily obtained at a cost of some 30% to 40%. The time, I venture to think, will come when owners would as soon send their vessels to sea without a compass or chronometer as without having had their stability calculated. It is to this cause that this inquiry has gone to such a length, and as it was, in our opinion, the duty of the owners to have had her stability calculated before sending her to sea, we shall not give them their costs.

(Signed) H. C. ROTHERY,
Wreck Commissioner.

We concur.

(Signed) R. WILSON,
BENJ. S. PICKARD,
ABSM. ANDERSON,
W. B. ROBINSON,
C.C.R.N., } Assessors.

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